

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

DOMESTIC PARASITE REPORT

1936

By
P. B. Dowden
and
P. A. Berry

Bu. Entomology & Plant Quarantine
New Haven, Conn.
February 8, 1937

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56 Hillhouse Ave., New Haven, Conn.

February 8, 1937

FOREST INSECT INVESTIGATIONS

GIPSY MOTH LABORATORY
17 E. HIGHLAND AVENUE
MELROSE HIGHLANDS, MASS.

Dear Mr. Evenden:

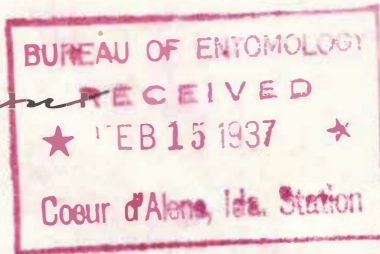
I am enclosing, for your information, copy of Part I of Domestic Parasite Report of this laboratory for 1936.

Very truly yours,

RC Brown

R. C. Brown,
Entomologist In Charge.

Encl.



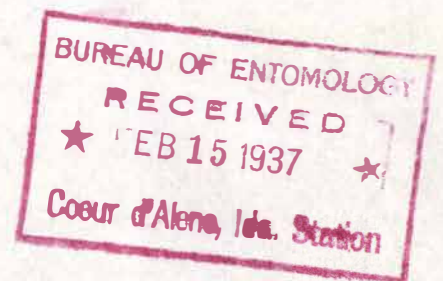
Domestic Parasite Report

P. B. Dowden

P. A. Berry

Part I - Indigenous host species received at New Haven from distant points in the United States.

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Part I Indigenous Host Species.

Summaries of this work are arranged by species and include:
Emergence, Liberations and Biological Notes.

Neodiprion tsugae Midd.

The purpose of rearing work conducted with this host species was to secure parasites that might be useful against Diprion polytomum in the east. Itoplectis montana was particularly desired, and it was considered worthwhile to expose D. polytomum in the laboratory at least, to the other promising species secured.

Emergence

Unfamiliarity with the species of parasites and their habits has caused some errors in the following records of emergence. This is particularly true of Dibrachys spp. It was not realized that two species of Dibrachys were involved and a large number were destroyed that were not separated. Dibrachys also has the habit of seeking seclusion and undoubtedly a number of Neodiprion cocoons were attacked at the laboratory by early issuing females. Issuance by this species is therefore disproportionately large. It is believed that figures on the other species are essentially correct.

Dibrachys and probably Amblymerus are gregarious so the number of adults that emerged does not represent cocoons attacked.

Separate tables are prepared for 1935 and 1936 shipments. There will, of course, be further issuance next spring from the 1936 material.

Emergence from 7,896 N. tsugae cocoons received Sept. 29, 1935

<u>Species</u>	<u>Fall Issuance</u>	<u>Spring Issuance</u>	<u>Total</u>
<u>Neodiprion tsugae</u> -----	1,035		1,035
----- sp. (m. l.)-----	8	24	32
(Tach.)-----		4	4
<u>Itopectis montana</u> Cush.-----	847	439	1,286
<u>Delomerista</u> n. sp. -----		1,223	1,223
<u>Spilecryptus</u> n. sp. -----		21	21
<u>Pezoporus</u> n. sp. -----		51	51
<u>Strus neodiprioni</u> Vier. -----		9	9
<u>Ischnus</u> n. sp. -----		2	2
* <u>Panagyrops</u> n. sp. -----		6	6
-----		2	2
* <u>Thysiotorus</u> n. sp. -----	32	28	60
* <u>Hamiteles tenellus</u> Say -----	47	183	230
* <u>Gelis ferruginosus</u> (Strickl.)--	10	21	31
* <u>Mesochorus</u> sp. -----		1	1
 <u>Amblymerus verditor</u> (Nort.)----	 26		 26
** <u>Dibrachys</u> spp. -----			366

*Probably secondary.

**Both primary and secondary. Mostly Dibrachys cava (Walk.) Examination of 56 showed 30 Dibrachys cava and 6 Dibrachys sp.

Table 2

Emergence from 13327 N. tsugae cocoons received Aug. 28 and Sept. 8, 1936

<u>Species</u>	<u>Fall Issuance</u>
Neodiprion tsugae	3570
Madremyia n. sp. Tach	45
(Tach)	33
(Tach)	1
Itoplectis montana Cush.	322
Delomerista n. sp.	1
Spilocryptus n. sp.	121
Pezoporus n. sp.	406
Mastrus neodiprioni Vier	27
Ischnus n. sp.	21
Panagyrops	19
	3
Thysiotorus	13
Hemiteles tenellus Say	52
Gelis ferruginosus (Strickl.)	9
Amblymerus verditor (Nort.)	53
Dibrachys cavus (Walk.)	67
	3

Liberations

<u>Species</u>	<u>Date</u>	<u>Point</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>
Itoplectis montana	Oct. 20, 1935	Orange, Ct.	25	100	125
	Nov. 8, 1935	" "	100	100	200
	Nov. 8, 1935	Kent, Conn.	174	116	290
	Apr. 23, 1936	Tupper Lake, N.Y.	65	348	413
	May 26, 1936	Orange, Conn.	1	16	17
	Sept. 24, 1936	Petersham, Mass.	100	100	200
Delomerista n.sp.	June 22, 1936	Orange, Conn.	268	80	348
	June 23, 1936	Tupper Lake, N.Y.	245	85	330

Biological Notes.

The following notes are based on very limited observation and must be considered tentative. All work done in the laboratory using Diprion polytomum host material.

Itoplectis montana Cush.

Attacks exposed cocoons readily, laying an internal egg. Will go into duff a short distance when held in a large cage. Probably would hunt around some for unexposed cocoons in forest. A high percentage of eggs fail to "come through." Parasite dying as egg or early larva. Dissections show remains surrounded by phagocytes. Out of about 1200 cocoons exposed to attack in fall of 1935 only 41 adults issued in spring of 1936. Dissections showed most of cocoons were attacked and a great many had a number of eggs laid in them. Only about 200 cocoons attacked this fall, but all oviposition done under observation to avoid superparasitism. The parasite is apparently multi-brooded overwintering in the host cocoon.

Delomerista n. sp.

Occurs in the Northeastern part of U.S. and Canada. - Attacks exposed D. polytomum cocoons readily. Not tried on covered cocoons. Lays an external egg, feeds externally. Overwinters as full grown single generation as a rule, but one female out this fall from cocoons collected in 1936. This female is ovipositing at present.

Spilocryptus n. sp. and Ischnus n. sp.

Remarks on these species are the same. Attack D. polytomum cocoons readily, will also attack in duff. Lay an external egg. About 200 cocoons attacked by each species while under observation, and dissections show oviposition taking place, but parasites do not seem to develop. In fact apparently very few eggs hatch. One larva of each species secured and transferred to depressed slide where it died after feeding two or three days.

Pegoporus n. sp.

Very difficult to get oviposition. A few eggs laid. They are laid externally.

Mastrus neodiprioni Vier.

Reared from D. polytomum cocoons collected at Tupper Lake, N. Y. Lays an external egg.

Dibrachys cavus (Walk)

Reared from D. polytomum cocoons collected at Orange, Conn.

Tachinids, 2 species -----

Did not succeed in getting oviposition.

Tryphoninae 3 species -----

First 2 groups probably attack larvae,

Amblymerus verditor (Mort.) ---

and laboratory conditions may be un-

Cryptine -----

suitable.

Panagyrops n. sp. -----

Thysiotorus n. sp. -----

Probably secondaries.

Hemiteles tenellus (Say) ----

Gelis ferruginosus (Strickl.) --

Nematus ericksonii Hartig

During the summer of 1935 George R. Hopping of the Canadian Entomological Branch noted an outbreak of the larch sawfly, Nematus ericksonii Hartig, in the Flathead Basin just north of the boundary between the United States and Canada. J. C. Evenden visited the Flathead National Forest, Montana, later in the season and found a rather severe infestation of this species along the north fork of the Flathead River. The larch sawfly was known to be present in the Great Lakes region of the United States, where at times it was heavily attacked by parasites, particularly the imported ichneumonid Mesoleius tenthredinidis Morley and the native tachinid fly Bessa selecta Meig. It was therefore considered worth while to study the parasitization at both localities with the idea of transferring important beneficial species from one region to the other if they were not present in both. Mr. Evenden collected 4,000 cocoons from the Flathead National Forest and L. W. Orr made six collections of several hundred cocoons each at several points in Michigan, Wisconsin, and Minnesota. The material was sent to the laboratory of the Division of Forest Insect Investigations at New Haven, Conn., for rearing and it was found that Mesoleius tenthredinidis, Bessa selecta, and a chalcidoid, Dibrachys n. sp., were present in both regions. Four specimens of Cryptinae, representing three species (Stylocryptus sp., Phygadeuon sp. and Aenoplex, n. sp.) emerged from the Montana material but did not appear from the Great Lakes region, and four specimens of another cryptine, Pezoporus indistinctus (Prov.) and a few specimens of Dibrachys appeared in the collections from the Great Lakes region, but were not reared from cocoons collected in Montana. Mesoleius tenthredinidis was a very important parasite in certain areas of the Great Lakes region, and present in appreciable numbers in western Montana. Bessa selecta was of less importance in both regions. Dibrachys, n. sp., was important in western Montana but apparently of little significance in the Great Lakes region.

The following table gives detailed results of rearing the various collections.

Summary of Nematus ericksonii Hartig (Larch Sawfly) Collections

Place	Results of Dissections					Results of Rearing									
	No. of cocoons collected	No. of cocoons dissected	dead larvae	living larvae	Internal Hymenop. (Mesoleius)	Internal Tachinid (Bessa)	External Chalcid (Dibrachys)	Mesoleius tenthredinidis Morley	Bessa selecta Mg.	Dibrachys n. sp.	Dibrachys n. sp.	Stylocryptus sp.	Phygadeuon sp.	Aenoplex n. sp.	Pezophorus indistinctus (Prov.)
Flathead N. F. Montana	4000	100	30	59	3	3	11	12	7	237		1	2	1	
Deer River Minnesota	1200	50	14	36	23	1		2	3						
Huron N.F. Luzerne Camp) Michigan	850	50	3	47					1						
Huron N.F. (Tawas District) Michigan	700	50	2	48						*1					2
Chequamegon N.F. Wisconsin	700	25		25	10			1		1	1				
Nicolet N.F. (Argonne Dist.) Wisconsin	400	25	3	22	9	1		8	3						
Upper Michigan Michigan	285	25	6	19	9	1			1						2

*This Dibrachys n. sp. (The same as that reared at the Flathead N.F. and Chequamegon N.F.) was reared from a Tachinid puparium.

Malacosoma disstria Hubn

Two lots of M. disstria egg masses were received from L. W. Orr. The first consisted of 147 masses from the Chippewa National Forest; the second of three lots from the Superior National Forest. The object of this work was to check the species of parasites present and the percentage of parasitization.

The first lot of 147 egg masses was isolated and detailed records kept of emergence. A total of 21,462 M. disstria larvae and 208 parasites were reared. All the eggs in 20 masses were carefully counted, and using the average per egg mass (204) thus obtained, it was estimated that there was a 72% hatch. Parasites issued from only 49 egg masses. The following species were represented.

<u>Telenomus clisiocampae</u> Ash.	---	119
<u>Ooencyrtus clisiocampae</u> (Ash.)	--	42
<u>Tetrastichus</u> n. sp.	---	47
		<hr/> 208

Parasitization was about 1%

When the second lot of egg masses arrived, M. disstria larvae were already hatching. Thirty masses were isolated and the remainder destroyed. A total of 46 parasites, belonging to the same species as reared from the first lot, were secured as follows:

<u>Telenomus clisiocampae</u> Ash	---	27
<u>Ooencyrtus</u> (Ash.)	---	17
<u>Tetrastichus</u> n. sp.		2
		<hr/> 46

Figuring the average number of eggs per egg mass as 204, the material from the Superior National Forest was even more lightly parasitized than that from the Chippewa National Forest.

J. V. Schaffner Jr. isolated a number of M. disstria egg masses collected in New England, and we have determined three different species of egg parasites that issued from them as follows:-

Coencyrtus clisiocampae Ash.
Telenomus clisiocampae Ash.
Ablerus clisiocampae (Ash)

The first two species appeared in the material from the Great Lakes region.

Neodiprion sp. possibly fulviceps.

A collection of 2478 cocoons of this species was received from Halsey, Nebraska on Sept. 8. 568 adult sawflies, 2 Tachinid flies and 1 Bombylid fly (secondary) issued during the fall. This material is now in hibernation.

Coleophora laricella Hubn.

A small shipment of overwintering Coleophora was received on March 9 from S. A. Graham. There were about 50 lineal feet of well infested twigs that were collected in Michigan. Only one parasite, a Mymarid, was reared. This was probably an Aphid egg parasite.